No. 8700017

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY, AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'PHR36'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 29th *day of* May *in the year of our Lord one thousand nine hundred and* eighty-seven.

*Attest:*

Kenneth B. Evans
*Commissioner*
*Plant Variety Protection Office*
*Agricultural Marketing Service*

Richard E. Lyng
*Secretary of Agriculture*

APPROVAL EXPIRES 2-28-88

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

# APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

*(Instructions on reverse)*

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION

3. VARIETY NAME
PHR36

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
Plant Breeding Division
Department of Corn Breeding
PO Box 85, Johnston, IA 50131-0085

5. PHONE *(Include area code)*
515/270-3300

FOR OFFICIAL USE ONLY

PVPO NUMBER
8700017

6. GENUS AND SPECIES NAME
Zea Mays

7. FAMILY NAME *(Botanical)*
Gramineae

FILING
DATE: November 12, 1986
TIME: 9:00 ☑ A.M. ☐ P.M.

8. KIND NAME
Corn

9. DATE OF DETERMINATION
1983

FEES RECEIVED
AMOUNT FOR FILING: $ 1800.00
DATE: November 10, 1986
AMOUNT FOR CERTIFICATE: $ 200.00
DATE: May 1, 1987

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
May 6, 1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. Richard L. McConnell
Plant Breeding Division
Pioneer Hi-Bred International, Inc.
PO Box 85, Johnston, IA 50131-0085
PHONE *(Include area code)*: 515/270-3363

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
- a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- b. ☒ Exhibit B, Novelty Statement.
- c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
- d. ☒ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ Yes ☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ Yes *(If "Yes," give date)*
☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES ?
☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT
Pioneer Hi-Bred International, Inc.
DATE

SIGNATURE OF APPLICANT
By: Richard L McConnell
DATE: 11/6/86

1

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

C O R N 8700017

'PHR36'

14A. Exhibit A. Origin and Breeding History

Pedigree: 848<3549<2203)3X15111X

Pioneer line PHR36, Zea mays L., a white dent corn inbred, was developed by Pioneer Hi-Bred International, Inc. by crossing the white proprietary inbred 203 to the yellow proprietary inbred 549 and backcrossing to 549 with selection for white kernels. This population was then crossed to Pioneer proprietary yellow inbred 848 and backcrossed twice to proprietary inbred 848 with selection for white kernels during the backcrossing process. Seven selfing generations with selection for white kernels followed the backcrossing. PHR36 was developed at Windfall, Indiana. During line development, crosses were made to white inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Windfall, Indiana, and at other Pioneer corn research stations in the central and northern Corn Belt. Additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand pollinated with observations made for uniformity.

PHR36 has shown uniformity and stability for all traits as described in Exhibit C (form LPGS-470-28) - "Objective Description of Variety". It has been self-pollinated and ear-rowed a sufficient number of generations with careful attention paid to uniformity of plant type to assure genetic purity and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity.

No variant traits have been observed or are expected in PHR36.

14B. Exhibit B. Novelty Statement for 'PHR36'

PHR36 is most similar to the Pioneer proprietary inbred line G50. PHR36 has white endosperm whereas G50 has yellow endosperm.

FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
*(Corn)*

# OBJECTIVE DESCRIPTION OF VARIETY
## CORN *(ZEA MAYS)*

NAME OF APPLICANT(S)
Pioneer Hi-Bred International, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
Plant Breeding Division
Department of Corn Breeding
PO Box 85
Johnston, IA 50131-0085

FOR OFFICIAL USE ONLY
PVPO NUMBER
8700017
VARIETY NAME OR TEMPORARY DESIGNATION
PHR36

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

**1. TYPE:**

[2] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNAMENTAL

**2. REGION WHERE BEST ADAPTED IN THE U.S.A.:**

[2] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

**3. MATURITY (In Region of Best Adaptability):**

*(Under "comments" (pg. 3) state how heat units were calculated)*

[ ][ ] DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK — [1][5][3][0] HEAT UNITS

[ ][ ] DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY — [ ][ ][ ][ ] HEAT UNITS

[ ][ ] DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE — [ ][ ][ ][ ] HEAT UNITS

**4. PLANT:**

[2][3][6] CM. HEIGHT (To tassel tip)

[1][1][4] CM. EAR HEIGHT (To base of top ear)

[0][6] CM. LENGTH OF TOP EAR INTERNODE

**Number of Tillers:**

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

**Number of Ears Per Stalk:**

[1] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

**Cytoplasm Type:**

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

**5. LEAF (Field Corn Inbred Examples Given):**

**Color:**

[3] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K166)

**Angle from Stalk (Upper half):**

[1] 1 = < 30° 2 = 30–60° 3 = > 60°

**Sheath Pubscence:**

[1] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

**Marginal Waves:**

[1] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

**Longitudinal Creases:**

[2] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

**Width:**

[0][6] CM. WIDEST POINT OF EAR NODE LEAF

**Length:**

[0][6][5] CM. EAR NODE LEAF

[2][1] NUMBER OF LEAVES PER MATURE PLANT

**6. TASSEL:**

[1][7] NUMBER OF LATERAL BRANCHES

**Branch Angle from Central Spike:**

[1] 1 = < 30° 2 = 30–40° 3 = > 45°

**Penduncle Length:**

[2][0] CM. FROM TOP LEAF TO BASAL BRANCHES

**Pollen Shed:**

[2] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[1] **Anther Color:** } 1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN
[5] **Glume Color:** } 6 = OTHER (Specify) _____

**Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)**

[0] "T" [0] "S" [0] "C" [ ] OTHER (Specify Cytoplasm and degrees of restoration) _____

**7. EAR (Husked Ear Data Except When Stated Otherwise):**

[1][5] CM LENGTH [3][4] MM. MID-POINT DIAMETER [8][3] GM. WEIGHT

**Kernel Rows:**

[2] 1 = INDISTINCT 2 = DISTINCT [1][4] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

**Silk Color (Exposed at Silking Stage):**

[1] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

**Husk Color:**

[2] FRESH } 1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK
[6] DRY } 4 = RED 5 = PURPLE 6 = BUFF

**Husk Extention: (Harvest Stage)**

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear) 3 = LONG (8–10CM Beyond Ear Tip) 4 = VERY LONG (> 10 CM)

**Husk Leaf:**

[ ] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM) 3 = LONG (> 15 CM)

**Shank:**

[1][5] CM LONG [6] NO. OF INTERNODES

**Position at Dry Husk Stage:**

[3] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

**Taper:**

[2] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

**Drying Time (Unhusked Ear):**

[ ] 1 = SLOW 2 = AVERAGE 3 = FAST

**8. KERNEL (Dried):**

**Size (From Ear Mid-Point):**

[1][0] MM LONG [0][8] MM. WIDE [0][5] MM. THICK

**Shape Grade (% Rounds)**

[1] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

8700017

**8. KERNEL (Dried) :**

[1] **Pericarp Color:** 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[2] **Aleurone Color:** 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[1] **Endosperm Color:** 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

**Endosperm Type:**

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[2 2] GM. WEIGHT /100 SEEDS (Unsized Sample)

**9. COB:**

[2 0] MM. DIAMETER AT MID-POINT

**Strength:**

[1] 1 = WEAK 2 = STRONG

**Color:**

[3] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

**10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):**

| | | | | | |
|---|---|---|---|---|---|
| [1] | STALK ROT (Diplodia) | [1] | STALK ROT (Fusarium) | [1] | STALK ROT (Gibberella) |
| [2] | NORTHERN LEAF BLIGHT | [1] | SOUTHERN LEAF BLIGHT | [2] | SMUT (Head smut) |
| [0] | SOUTHERN RUST | [2] | CORN SMUT (Common) | [2] | BACTERIAL WILT (Stewart's) |
| [2] | BACTERIAL LEAF BLIGHT (Goss') | [1] | MAIZE DWARF MOSAIC | [0] | STUNT |
| [ ] | OTHER (Specify) | | | | |

**11. INSECT RESISTANCT (0 = Not Tested, 1 = Susceptible, 2 = Resistant):**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [1] | CORNBORER | [0] | EARWORM | [0] | SAPBEETLE | [0] | APHID |
| [0] | ROOTWORM (Northern) | [1] | ROOTWORM (Western) | | | | |
| [0] | ROOTWORM (Southern) | [ ] | OTHER (Specify) _____ | | | | |

**12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:**

| CHARACTER | VARIETY | CHARACTER | VARIETY |
|---|---|---|---|
| Maturity | G50 | Kernel Type | G50 |
| Plant Type | G50 | Quality (Edible) | |
| Ear Type | G50 | Usage | |

**REFERENCES:**


U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 — A System for the Classification of Corn Inbred Lines — PhD. Thesis, Ohio State University.


**COMMENTS:** Heat units are accumulated from daily temperatures as follows:
HI = Maximum air temperature in Fahrenheit, but not greater than 86.
LO = Minimum air temperature in Fahrenheit, but not less than 50.
Heat Units = (HI + LO)/2 - 50, but not less than 0.

6

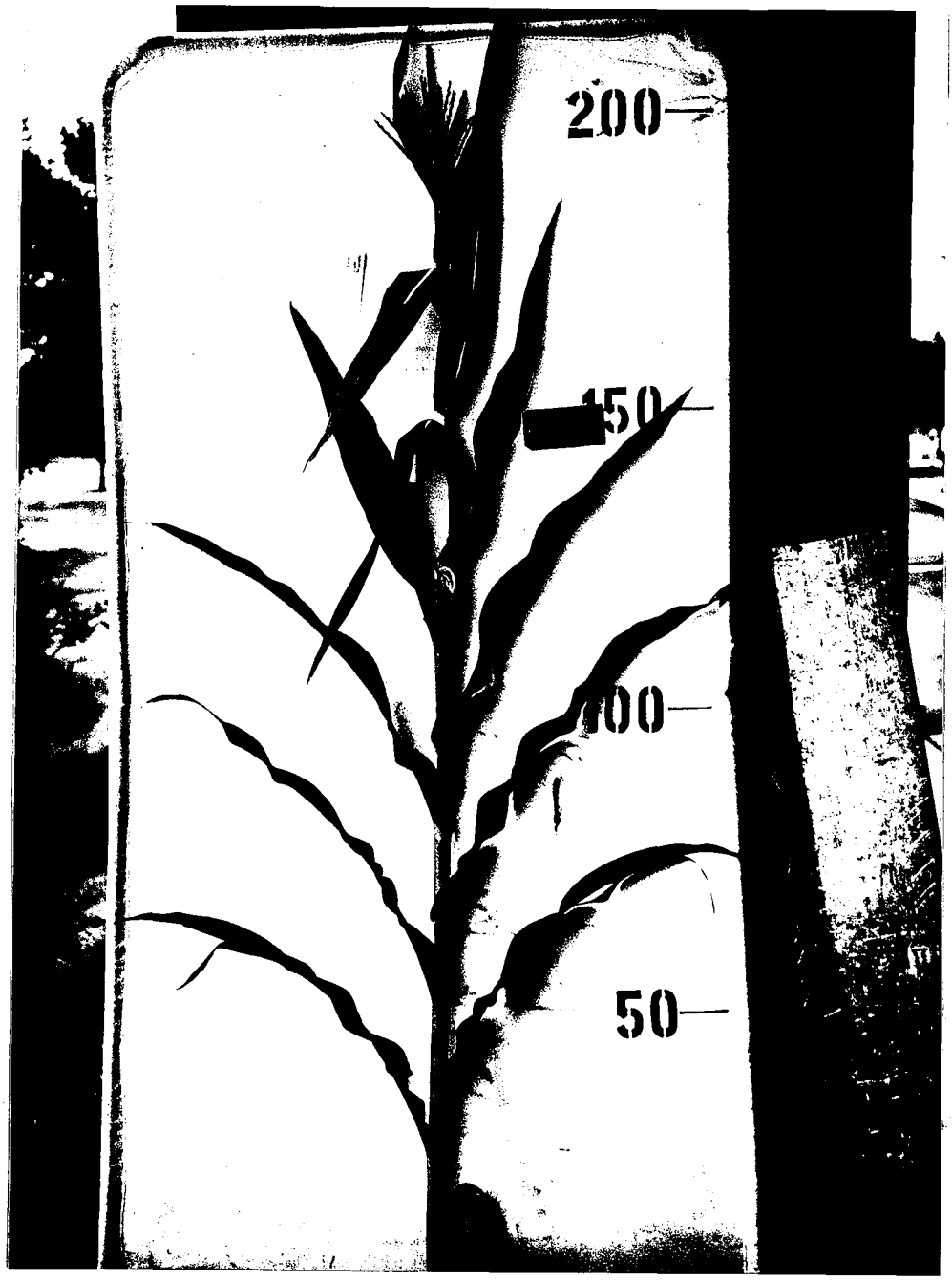
14D. Exhibit D. Additional Description of 'PHR36'

PHR36 is a white dent inbred line of corn, Zea mays L.

As an inbred per se, PHR36 is similar to the Pioneer yellow inbred G50. The similarities are expected because some of the parentage of both lines are the same. PHR36 is relatively early in maturity compared to most of the commonly used white inbred lines.

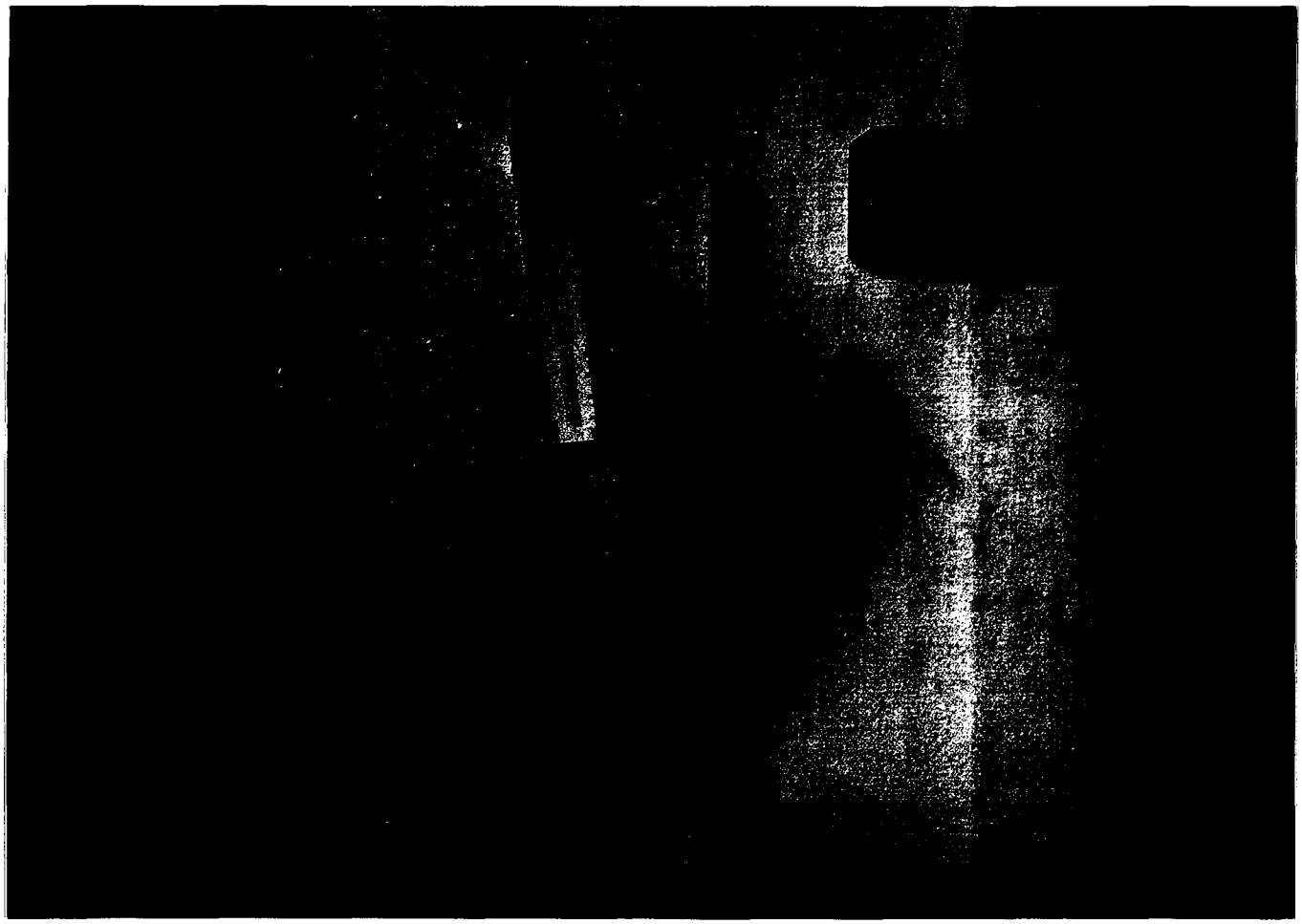
14D. Exhibit D. Additional Description of 'PHR36' (continued)

a. Whole plant



14D. Exhibit D. Additional Description of 'PHR36' (continued)

b. Tassel



14E. Exhibit E. Statement of the Basis of Applicant's Ownership

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of PHR36. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of PHR36.